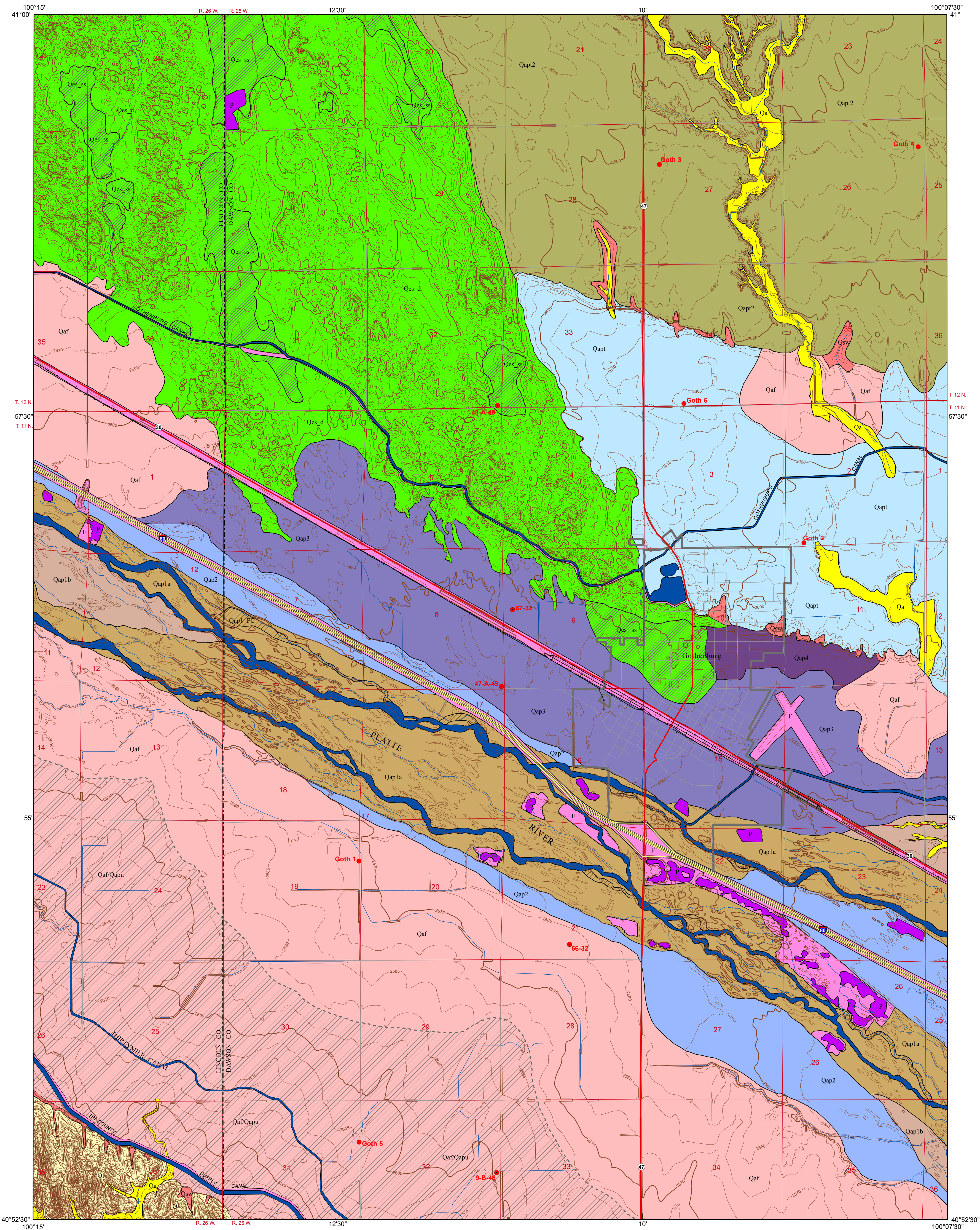


Surficial Geology of the Gothenburg 7.5 Minute Quadrangle, Nebraska

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Version 1.0, September 2012



Recent alluvium (Latest Holocene)

Sandy to silty deposits

Sediments associated with smaller streams tributary to the Platte River. Most sediment in this mapping unit was deposited during the late Holocene. Sediments are generally less than 2 m (<6.5 ft) thick, however some Qa sediments on alluvial fans may be thicker. The sediment found in these units generally overlies alluvial sediment deposited in alluvial fans or by the Platte River.

Qap1 Platte River alluvium, recent braided channel belt (Late Holocene/Historic)

Sand and gravel, with local silty sediments

Qap1 deposits are directly adjacent to the Platte River. Generally, groundwater is within 1-2 m (~3-6.5 ft) of the surface, and the land is subject to frequent spring flooding events. Most land is cottonwood/cedar forest, primarily used for recreation and gravel mining. Generally these sediments are less than 9 m (~30 ft) thick.

Qap1a Deposits are the youngest sediments and have abundant bar and swale topography.

Qap1b Deposits have more localized bar and swale topography, and are found (~1 m or 1-3 ft) higher than Qap1 deposits.

Qap1c Flood channels of the Platte River. Channels are occupied by water during spring flooding events. Little if any vegetation is present in channels during drier times of the year.

Qap2 Platte River alluvium (Middle to Late Holocene)

Fine to medium sand with local areas of gravel

Older alluvium of the Platte River that is slightly higher (~1.5 m or 5 ft) above the modern Platte River floodplain. Bar and swale topography is only visible locally. The relatively small area mapped as Qap2 is primarily irrigated farmland. Sediments of this unit are generally about 10 m (~32 ft) thick.

Qap3 Platte River alluvium (Early Holocene)

Fine to medium sand with local areas of gravel

Older deposits of the Platte River that are found ~1.5-2 m (~5-8 ft) above the modern floodplain. Bar and swale topography is largely absent. Sediments of this unit are generally about 10 m (~32 ft) thick.

Qap4 Platte River alluvium (Late Pleistocene or Early Holocene)

Fine to medium sand with local areas of gravel

Older deposits of the Platte River about 2.5 m (~12 ft) above modern floodplain, with no surficial alluvial topography present. Sediment was most likely deposited around the late Pleistocene or early Holocene. This deposit directly underlies eolian sand (Qes_d) to the west, as well as the southeast portion of the town of Gothenburg. This unit is also covered in part by slopewash and alluvial fan sediment. Sediments of this unit are generally 10 m (~32 ft) thick.

Qap2 Platte River alluvial terrace (Late Pleistocene)

Loess covered fine to medium sand and pebbly sand

Loess covered sandy alluvial sediments of the Platte River 23-25 m (75-80 ft) above the modern floodplain. This unit is covered by Peoria Loess, which was deposited up until ~14,000 years ago, suggesting this terrace is late Pleistocene in age. This unit is used extensively as cropland.

Qes_d Eolian dune sand (Late Pleistocene/Holocene)

Fine sand

Windblown dune sand deposits of the Nebraska Sand Hills. Where mapped, dunes have relief greater than 23 m (75 ft). The sand is on average 15 m (50 ft) thick and overlies Pleistocene/Holocene age alluvial deposits. Recent studies have shown the dunes in the Nebraska Sand Hills were most recently active ~850 years ago (see Loope and Swinehart, 2000). Although no numerical ages were taken from dunes on the map, the dunes are likely late Pleistocene to early Holocene in age. Areas mapped as dune sand are generally rangeland and to a lesser extent irrigated agricultural cropland.

Qes_ss Eolian sand sheet (Late Pleistocene/ Holocene)

Fine Sand

Windblown sand sheet deposits with less than 3 m (~10 ft) of relief and few recognizable dune forms. Some areas of sand sheet have elevations near the water table, and thus have abundant vegetation. Areas mapped as sand sheet are generally irrigated agricultural cropland or rangeland.

Qaf Alluvial fan deposits (Holocene)

Fine sandy, silty and clay-rich deposits

Alluvial fan sediments deposited adjacent to and sourced from the loess (Ql) uplands shown on the southwest corner of the map, which continue just off the southern edge of the map to the southeast. Alluvial fans on the southern portion of the map may be greater than 10 m (~33 ft) in thickness near the loess uplands, but thin considerably with distance from source regions. These fans aggraded sporadically throughout the Holocene. These alluvial fans are extensively farmed, and are largely irrigated by an elaborate network of canals, as well as water pumped from underlying sand and gravel aquifers.

Alluvial fan sediments are also deposited adjacent to and sourced from the Qes_d dune sand on the northwestern portion of the map, and along other tributaries of the Platte River on the eastern side of the map. Generally, these sediments are less than 5 m (~15 ft) thick.

Qaf/Qapu Alluvial fan deposit on undifferentiated Platte River alluvial terrace (Late Pleistocene/ Holocene)

Fine sandy, silty and clay-rich alluvial fan deposits overlying fine to medium sand and pebbly sand with localized areas of peat

Platte River alluvial terrace covered by Qaf alluvial fan deposits. The sediment in the alluvial terrace are only visible in core, and are not exposed at the surface. Although this terrace was not directly dated, relative dating suggests it is younger than the Qap2 deposit, or likely younger than ~13 ka.

Ql Peoria Loess (Late Pleistocene/Holocene).

Silt to silty clay.

Peoria loess in the mapping region is up to 45 m (150 ft) thick. The loess is generally massive silt or silty clay with secondary carbonates present locally. Peoria Loess was deposited between 25,000 to 14,000 years ago. Peoria Loess in the Loess Uplands may be locally overlain by Holocene age loess of the Bignell Formation. Recent studies show the Bignell Loess to be less than 6 m (20 ft) thick where present, and deposited beginning 9-11 ka, and being deposited sporadically up until about 700 years ago (Mason et. al., 2003).

Qsw Slopewash (Late Holocene)

Fine sand/silt

Slopewash deposits are found directly adjacent to and sourced from steep slopes of the loess uplands (Ql) and the higher terraces (Qap2 and Qap22) of the Platte River. Slopewash deposits are generally 1-2 m (3-6 ft) thick.

F Fill

P Gravel Pit

Historic CSD test hole locations

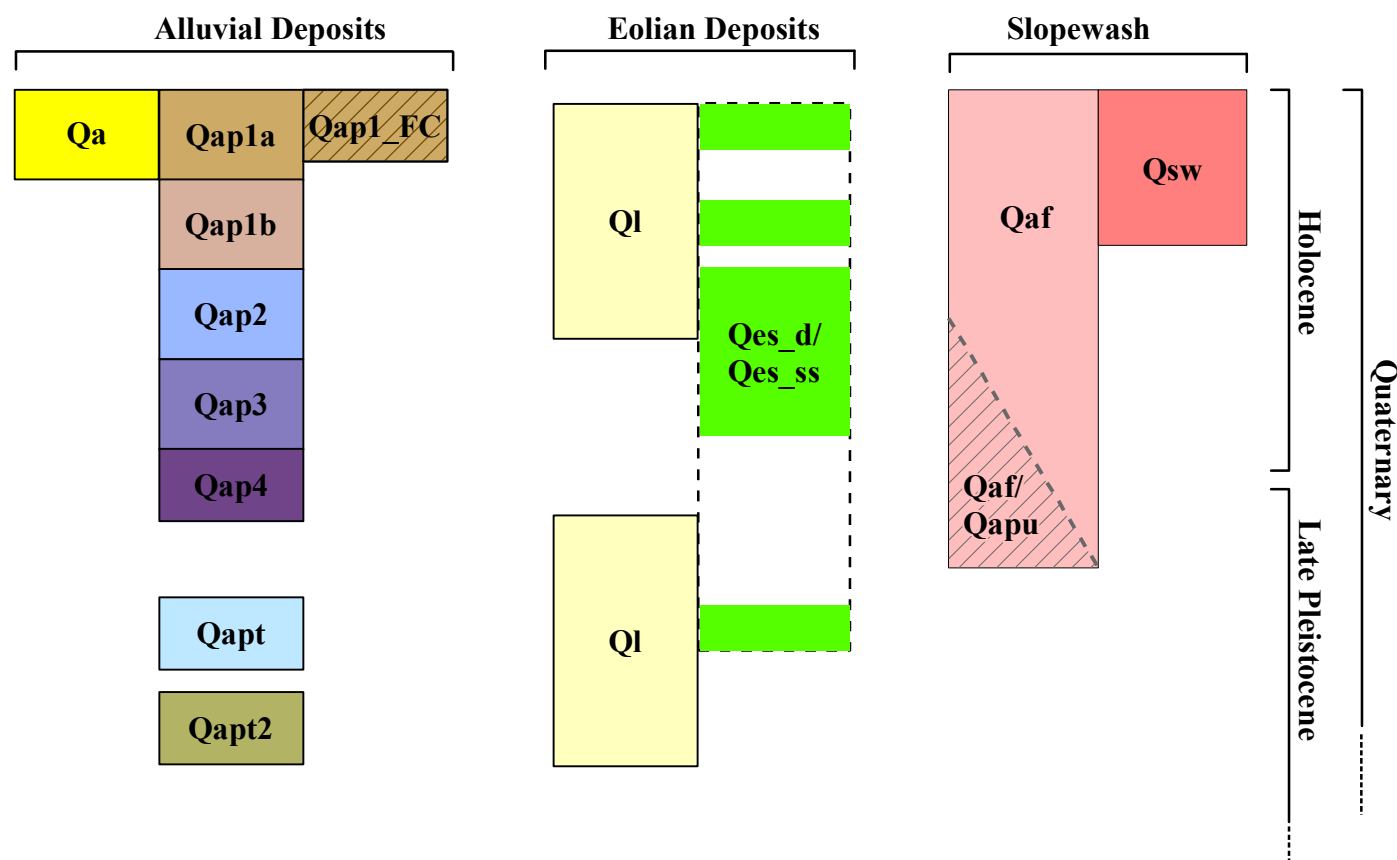
Location of Geoprobe cores taken in 2012

Gothenburg limits

References Sited

Loope, D. B., Swinehart, J. B., 2000. Thinking like a dune field: Geologic history in the Nebraska Sand Hills. Great Plains Research 10, p. 5-35.

Mason, J. A., Jacobs, P. M., Hanson, P. R., Miao, X. D., Goble, R. J., 2003. Sources and paleoclimatic significance of Holocene Bignell Loess, Central Great Plains, USA. Quaternary Research 60, p. 330-339.



This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.

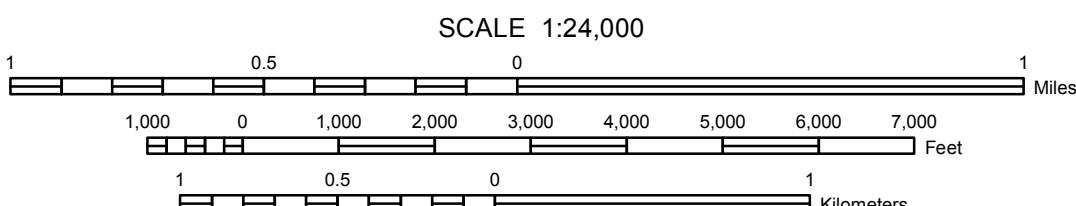
Projection: UTM zone 14 North, NAD83

Contours from the Nebraska Department of Natural Resources, compiled from USGS 7.5 minute topographic quadrangles

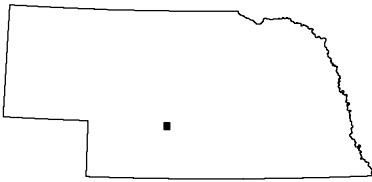
Additional base data derived from 2005 second edition TIGER/line files



Magnetic North
Declination
Approximately 5°59',
2012



CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL



Brady	Oskema Tale South	Rain Valley South
Jeffery Reservoir NE	Gothenburg	Willow Island
Jeffery Reservoir SE	Gothenburg SW	Gothenburg SE